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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,277	08/27/2003	Takayuki Tsutsumi	Q77174	4437

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EXAMINER	
SONI, KETAN S	

ART UNIT	PAPER NUMBER
2619	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/648,277	TSUTSUMI ET AL.
	Examiner	Art Unit
	Ketan Soni	~~2616~~ 2619 K.S.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :4/15/04, 7/3/06, 3/10/06, 9/15/06.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement submitted on Apr/15/2004; Mar/10/ 2006; Jul/03/2006; and Sep/15/2006 have been considered by the Examiner and made of record in the application file.

Claim Objections

Claim 5 is objected to because of the following informalities: Applicant is respectfully suggested to correct spelling and other typographical errors in the application. Corrected line: 4 of claim: 5 should read as: ".. error ratio in the access point data table,..". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim: 1, applicant is claiming "a fast roaming system". But within claim: 1, it is not clear what is the "fast roaming system" contains, how many access point/s, etc.? Hence claim: 1 is vague and indefinite.

Claim 1, line: 6 recite the limitation "access point further comprises". It is not clear which "Access Point" applicant is referring to, one serving as a parent access point

or one serving as an adjacent access point. Thus there is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 - 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Takayama et al. (US 6917804 B2)** in view of **Iimori (US 6393282 B1).**

Consider **Claim:** 1, Takayama et al. discloses a structure wherein a mobile terminal, while communicating with an access point, serving as a parent station, over a wireless LAN that conforms to the IEEE 802.11 specifications, can be quickly switched from the parent station to an adjacent access point having an overlapping communication range (As shown in Fig: 1 in a high speed roaming, Station 3 moves from one AP to another AP, col: 4, lines: 29-33);

wherein the access point (Fig: 2) comprises: a wireless LAN interface for communicating with the mobile terminal over the wireless LAN (Fig: 2, Ethernet controller executes data transmission/reception to and from the transmission/reception control, col: 5, lines: 10-12),

a roaming unit for performing a roaming operation based on the IEEE 802.1113 specifications (Roaming is carried out by transmitting the authentication request frame as per IEEE 802.11, col: 1, lines: 63-65),

a beacon transmitter for transmitting a beacon signal to provide synchronization with the mobile terminal (AP sends Radio Beacon synchronously from the access point to mobile stations, col: 3, lines: 28-30), and

a data transmitter for transmitting, to the mobile terminal (Fig: 2, MAC controller 22 controls data service function and transmits/receives the frame, col: 5, lines: 3-5), access point data required for the roaming operation (Fig: 2, EEPROM 24 stores information of the AP data, and execution of roaming operation). Even though Takayama et al. discloses a mobile terminal, is generally silent about the internal circuit blocks of mobile terminal comprising a wireless LAN interface for communicating with

an access point over the wireless LAN, an access point search unit for searching for peripheral connectable access points and for obtaining access point data, a roaming execution unit for transferring the connection of the mobile terminal from a currently connected access point to another, designated access point, an access point data table in which the access point data detected and obtained by the access point search unit are recorded, and a function controller for, when a condition for communicating with the current access point matches a predetermined roaming operation start condition, employing a predetermined order sequence to select one of the access points entered in the access point data table, and for driving the roaming unit to perform the roaming operation for the access point that is selected.

However in the same field of endeavor, Iimori discloses the mobile terminal (Fig: 2) comprises a wireless LAN interface for communicating with an access point over the wireless LAN (After the radio frequency signals transmitted from the base stations BSa1 to BSa6, they are received by an antenna 1, they are inputted via an antenna duplexer (DUP) 2 to a reception circuit (RX) 3. In the reception circuit 3, the radio frequency signal is mixed with the reception local oscillating signal outputted from a frequency synthesizer (SYN) 4 and frequency-converted into an intermediate frequency signal, col: 6, lines: 32-37),

an access point search unit for searching for peripheral connectable access points and for obtaining access point data, (a state determining function 40a of determining the state of its own station and base-station searching control means 40b for controlling the operation of searching for the base station on the basis of the result of the determination

at the state determining function 40a, col: 8, lines: 14-19),

a roaming execution unit for transferring the connection of the mobile terminal from a currently connected access point to another, designated access point (Fig: 2, Controller-40 controls switching from one point (AP or BS) to another point by information received from 40-b, col: 8, lines: 15-18),

an access point data table in which the access point data detected and obtained by the access point search unit are recorded (Storage section 41 is attached to controller 40 for a handover history storage section 41a, col: 8, lines: 20-22), and

a function controller for, when a condition for communicating with the current access point matches a predetermined roaming operation start condition, employing a predetermined order sequence to select one of the access points entered in the access point data table, and for driving the roaming unit to perform the roaming operation for the access point that is selected (Controller 40 is composed of, control function of performing radio connection control or communication control with the base station and also a state determining function 40a of determining the state of its own station and base-station searching control means 40b for controlling the operation of searching for the base station (while switching from one point to another is roaming) on the basis of the result of the determination at the state determining function 40a, col: 8, lines: 14-19).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to incorporate and provide an infrastructure type wireless LAN communication and execute speedy roaming from one access point to

another as taught by Takayama, with the method of Iimori where the configuration of the mobile terminal station is capable of access point search control, updating handover history storage table, and controlling radio connection switching and synchronizing communication. The motivation is to provide high speed roaming functionality in the mobile radio communication environment with access point searching and synchronization functions.

Consider **Claim:** 2, and as applied to claim: 1 above, Takayama et al. as modified by Iimori discloses claim: 1. Further taught by combination and specifically by Iimori wherein the mobile terminal provides a roaming order as the order condition for the access point that is recorded in the access point data table (The storage section 41 provides handover history to controller 40. The handover history contains memory for the destination base station, col: 8 lines: 20-25); and wherein, until a roaming process is completed, the function controller repeats the roaming process in the roaming order to sequentially select a roaming destination (In the handover process, the controller 40 uses information about the base station at the handover destination that is stored in the memory of the handover history storage section 41a, col: 10, lines: 19-22).

Consider **Claim: 3**, and as applied to claim: 2 above, Takayama et al. as modified by Iimori discloses claim: 2. Further taught by combination and specifically by Iimori, wherein the mobile terminal monitors a reception level of a wireless signal received from an connectable access point, stores the reception level to the access

point data

table, and sets the roaming order beginning with the highest reception level (MS monitors the reception electric-field strength level of the radio freq signal, then this electric field strength level is compared with existing level. Depending upon the electric field strength level, handover is determined, col: 9, lines: 57-64).

Consider **Claim:** 4, and as applied to claim: 2 above, Takayama et al. as modified by Iimori discloses claim: 2. In addition Takayama discloses that the data transmitter of the access point transmits, to the mobile terminal, the number of mobile terminals connected to the access point (Fig: 2, MAC controller 22 controls data service function and transmits/receives the frame to/from the mobile station, col: 5, lines: 3-5). In addition Iimori discloses the access point search unit of the mobile terminal stores, in the access point data table (a state determining function 40a of determining the state of its own station and base-station searching control means 40b for controlling the operation of searching for the base station on the basis of the result of the determination at the state determining function 40a, col: 8, lines: 14-19), the number of mobile terminals that is received, and sets the roaming order beginning with the smallest number of the mobile terminals connected to the access point (The storage section 41 provides handover history to controller 40. The handover history contains memory for the destination base station, col: 8 lines: 20-25; additionally in the moving state, priority search for eight neighboring base stations in the order of description is stored, col: 9,

lines: 1-3).

Consider **Claim:** 5, and as applied to claim: 2 above, Takayama et al. as modified by Iimori discloses claim: 2. In addition Takayama discloses wherein the data transmitter of the access point transmits, to the mobile terminal, an error ratio of data that are exchanged; and wherein the access point search unit of the mobile terminal stores the received error ratio in the access point data table, and sets the roaming order beginning with the lowest error ratio (when the quality (because of packet errors or RSSI level) the current connected subscription access point becomes smaller than the threshold value, the station contacts the database to compare communication situations of the neighboring APs, for the best communication environment, col: 10, lines: 30-35). In addition Iimori discloses the access point search unit of the mobile terminal stores the received error ratio in the access point data table, and sets the roaming order beginning with the lowest error ratio (MS monitors the reception electric-field strength level of the radio freq signal, then this electric field strength level is compared with existing level. Depending upon the electric field strength level, handover is determined, col: 9, lines: 57-64).

Consider **Claim:** 6, and as applied to claim: 2 above, Takayama et al. as modified by Iimori discloses claim: 2. In addition Takayama discloses, wherein the data transmitter of the access point transmits, to the mobile terminal, a communication ratio for a communication band of the access point; and wherein the access point search unit

of the mobile terminal stores the received communication ratio in the access point data table, and sets the roaming order beginning with the lowest communication ratio (When the beacon quality of the connected access point is lowered smaller than the threshold value, the station starts the roaming function and then applies directly the subscription operation to the access point having the best communication condition among the access points, col: 6, lines: 52-57).

Consider **Claim:** 7, and as applied to claim: 2 above, Takayama et al. as modified by Iimori discloses claim: 2. In addition Takayama discloses, wherein the data transmitter of the access point transmits, to the mobile terminal, traffic data that include the number of mobile terminals connected to the access point, the error ratio of data that are exchanged, and the communication ratio for the communication band of the access point; wherein the access point search unit of the mobile terminal stores the number of mobile terminals, the error ratio and the communication ratio in the access point data table (EEPROM 24 stores & updates the hopping information of the neighboring access points, etc. and executing the roaming operation, four neighboring access points registered in advance by using NMS (Network Management System) at maximum (e.g., channels or identification information of four neighboring access points at maximum), the initial values necessary at the time of starting, and others, col: 5, lines: 14-20). In addition Iimori discloses that wherein the function controller of the mobile terminal adds predetermined weights to multiple entries in the access point data table, including the number of mobile terminals, the error ratio and the

communication ratio, obtains the sums for the individual access points, and sets the roaming order beginning with the smallest sum (Controller 40 is composed of, control function of performing radio connection control or communication control with the base station and also a state determining function 40a of determining the state of its own station and base-station searching control means 40b for controlling the operation of searching for the base station (while switching from one point to another is roaming) on the basis of the result of the determination at the state determining function 40a, col: 8, lines: 14-19).

Consider **Claim:** 8, and as applied to claim: 1 above, Takayama et al. as modified by Iimori discloses claim: 1. In addition Iimori discloses wherein the mobile terminal further comprises: a reception level area, in the access point data table, for which,

during communication, reception levels of wireless signals received from the parent station that is an access point are monitored and stored sequentially at predetermined times (MS monitors the reception electric-field strength level of the radio freq signal, then this electric field strength level is compared with existing level. Depending upon the electric field strength level, handover is determined, col: 9, lines: 57-64); a level comparator for comparing the reception level of each received wireless signal with reception levels in the past (The reception of electric field strength level sensed is compared with preset determination level, col: 9, lines: 59-61);

a counter for counting the times for comparison (when the number of repeats becomes,

for example, three or more, the mobile station, at step 10j, performs control, col: 13, lines: 17-18); and a roaming start instruction unit for defining, as the predetermined roaming start condition, when the result of the comparison, the reception level is lowered continuously by the number of times that matches a predetermined count (mobile station, at step 10k, counts up the number of times the search is repeated and, at step 10i, determines the number of searches repeated. Then, when the number of repeats becomes, for example, three or more, the mobile station, at step 10j, performs control in such a manner that the determination level of the handover is decreased by, for example, 1 dB each time the search is repeated, col: 13, lines: 15-21).

Consider **Claim:** 9, and as applied to claim: 8 above, Takayama et al. as modified by Iimori discloses claim: 8. In addition Iimori discloses, wherein the mobile terminal further includes: a roaming start instruction unit for comparing, with the reception levels of signals received from the connected parent station, a reception level of a wireless signal obtained by the access point search unit, and for defining, as the roaming start, when the reception level of the signal obtained by the access point search unit is a predetermined value or larger (The reception of electric field strength level sensed is compared with preset determination level, col: 9, lines: 59-61).

Consider **Claim:** 10, and as applied to claim: 1 above, Takayama et al. as modified by Iimori discloses claim: 1. In addition, Takayama et al. discloses a roaming start instruction unit for extracting an error ratio included in a beacon signal received

from the connected parent station, and storing the error ratio, and for defining, as the roaming start, when the error ratio is larger than a predetermined error ratio (When the beacon quality of the connected access point is lowered smaller than the threshold value, the station starts the roaming function, col: 6, lines: 52-55).

Consider **Claim:** 11, and as applied to claim: 1 above, Takayama et al. as modified by Iimori discloses claim: 1. In addition, Takayama et al. discloses the access point search unit of the mobile terminal obtains the end time of a contention-free period, which are included both a beacon signal and a probe response; and wherein, the access point search unit searches for peripheral access points during a period except for a period where data are transmitted and received, after the contention-free period is over (In the infrastructure type wireless LAN in the above 3, in order to execute the roaming (this means to execute the switching of the communication connection from one access point to another access point herein) from one access point into which the station is subscribed to another access point, the station executes the operation (scanning) to find the access point into which the station can subscribe after such station transmits the probe request frame and then receives the probe response frame, col: 1, lines: 42-49).

Consider **Claim:** 12, and as applied to claim: 1 above, Takayama et al. as modified by Iimori discloses claim: 1. In addition, Takayama et al. discloses one selected access point is located as a master parent station for transmitting a

synchronized packet (As shown in FIG. 4, in the master AP, starts to cause the access points to synchronize with each other (step S41)); and wherein the master access point includes a synchronized packet transmitter for transmitting, to another access point, a synchronized packet that is synchronized with a beacon signal transmitted by the master access point (As shown in FIG. 4, in the master AP, the CPU 21 immediately sends out the first master beacon to the Ethernet networks via the Ethernet controller 23 at the time of start to cause the access points to synchronize with each other (step S41), col: 7, lines: 38-40); and wherein each of the other access points includes:

a synchronized packet receiver for receiving the synchronized packet (The master beacon transmitted from the master AP is received by the access points other than the master AP, col: 6, lines: 14-15); and a beacon transmitter for defining (master beacon transmitted from master AP, col: 6, lines: 17-18), as a reference time, the reception time for the synchronized packet, and for, after a predetermined time has elapsed following the reception of the reference time, transmitting a beacon signal for each radio channel, without overlapping a beacon signal from another access point (The number of times n by which the master beacon is not received within a predetermined time is counted so as to start the backup AP (step S53), col: 7, lines: 60-63).

Consider **Claim:** 13, and as applied to claim: 12 above, Takayama et al. as modified by Iimori discloses claim: 12. In addition, Takayama et al. discloses

a passive scanner for receiving a beacon signal and for searching for an access point (scanning mode is switched into the passive mode scan if the access point cannot be found within BSS (Basic Service Set) and then the passive mode scan is carried out, col: 1, lines: 54-55); and a beacon table, in which the correlation between a wireless channel and a beacon transmission time is recorded (Based on monitoring of the radio beacons, construct the monitored hopping information as a database, col: 3, lines: 35-36), wherein the passive scanner performs the passive scanning at the time recorded in the beacon table, excluding the time whereat the mobile terminal is transmitting and receiving data (scanning mode is switched into the passive mode scan if the access point cannot be found within BSS (Basic Service Set) and then the passive mode scan is carried out, col: 1, lines: 54-55).

Consider **Claim:** 14, and as applied to claim: 12 above, Takayama et al. as modified by Iimori discloses claim: 12. In addition, Takayama et al. discloses an active scanner (probing) for examining an access point from which a response is received relative to a search packet that the access point search unit has transmitted to the access point (The station transmits the probe request frame, then receives the response frame (probe response frame) sent from the access point and compares, col: 10, lines: 36-38), wherein, when the passive scanner fails to obtain the access point through passive scanning, the active scanner performs the active scanning (It is well known that in case the access point cannot be found yet, the active mode scan and the passive mode scan are repeated, col: 1, lines: 56-57).

Conclusion

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

- Cervello et al. (U.S. Pub/Patent # 6985465 B2) discloses: Dynamic channel selection scheme for IEEE 802.11 WLANS.
- Trompower et al. (U.S. Pub/Patent # 6088591) discloses: Cellular system handoff protocol.
- Chan et al. (U.S. Pub/Patent # 6516196) discloses: Intelligent burst control functions for wireless communications systems.
- Mahany et al. (U.S. Pub/Patent # 5790536) discloses: Hierarchical communication system providing intelligent data, program and processing migration.

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

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Hand-delivered responses should be brought to

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Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ketan Soni whose telephone number is (571) 270-1782. The Examiner can normally be reached on Monday-Thursday from 7:30am to 6:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Vu, Huy D. can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028. If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Ketan Soni

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Oct 03, 2007.

HUY D. VU
SUPERVISORY PATENT EXAMINER
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